

Ex Ante Review Phase 2

Table Error! No text of specified style in document.-1: Project Information

IOU	PG&E
Application ID	2K12079864
Application Date	2/8/12
Program ID	PGE21011
Program Name	Customized Calculated Incentive Program
Program Year	2012
Itron Project ID	X068
IOU Ex Ante Savings Date	2/8/12
ED Measure Name	Replace Chillers
Project Description	Chiller Retrofit
Date of ED Review(s)	3/8/12 and 8/24/12
Primary Reviewer and Firm	Keith Rothenberg/Energy Metrics
Review Supervisor and Firm	Joseph Ball/Itron
Type of Review (Desk, On-site, Full M&V, Tool)	On-Site
ED Recommendation	Ex ante savings calculations conditionally approved. Approved ex ante savings are the average between ED's estimate and the IOU's final estimate.

Measure Description

The facility has a central chiller plant that produces and distributes chilled water throughout the campus. The chiller plant has 12 large capacity water cooled centrifugal chillers of various vintages. Each chiller has a nominal capacity in the 1,200- 1,500 ton range. Some of the original chillers have been replaced and several are not functioning. The chiller plant load has declined in recent years as the number of buildings on the campus has been reduced. The customer proposes to install a new 1,250 ton capacity water-cooled centrifugal chiller where chiller number 1 (a non functioning chiller) is currently located. Note: The proposed chiller is not a VFD driven chiller, it is a higher than Title 24 minimum efficiency chiller. The customer has provided an estimated completion date of December 2012 in the application documents.

Summary of Review

A phase 1 ex ante review was performed by ED on 3/8/12. The initial submission from the customer characterized the project as involving the removal of four chillers and the installation of one new chiller as a replacement. The customer's final plan is to remove one non functioning chiller and install a new high efficiency chiller in its place.

This document is the phase 2 ex ante review for this project. ED has reviewed the IOU's draft and final calculations, the project application, the project application review, data provided by the customer including 11 months of manual chiller logs and the proposed chiller performance data provided by the chiller manufacturer. ED has inspected the chiller plant and attended meetings with the customer and IOU. ED has performed independent calculations to estimate the project impacts.

ED's estimate of the annual savings impact is less than the IOU's estimate. The IOU's analysis is a complex analysis of all chillers that are required to operate to meet the total load. ED's analysis simply evaluates the annual load and performance of the baseline and proposed chillers using the same performance data as the IOU.

Exhibit 1 below provides a summary of the project impact claim history. ED selected this project for ex ante review in February 2012. The original documentation ED received included an undated savings estimate prepared by the customer indicating 300 kW demand reduction and 985,000 kWh annual savings. Also included was an IOU application listing 300 kW demand reduction and 1,971,000 kWh annual savings and an estimated incentive of \$207,390. As the project developed the IOU's reviewer prepared draft calculations in June 2012 showing 632,226 kWh annual savings impacts, no demand reduction. The IOU's final calculations, submitted 8/16/12, estimate the impacts of the project to be 56 kW demand reduction and 634,207 kWh annual energy savings with an incentive of \$40,987.50. ED prepared a separate analysis of the project impacts and estimates the project will reduce demand by 61.6 kW and save 518,445 kWh annually. ED's estimate is within +/-20% of the IOU's final estimate and the average of the two estimates is the frozen ex ante value for this project.

Exhibit 1 Summary of the Project Impact Claim History

	kW	kWh	Estimated Incentive
Customer Estimate (undated)	300	985,000	None
Original Application (2/8/12)	300	1,971,000	\$ 207,390.00
IOU Draft (6/22/12)	0	632,226	None
IOU Final (8/16/12)	56	634,207	\$ 40,987.50
ED (8/24/12)	61.6	518,445	NA
ED-IOU Final	5.6	(115,762)	
ED/IOU % difference	10.0%	-18.3%	
(ED+IOU Final)/2	58.8	576,326	
The difference between the ED and the Final IOU estimated impact is less than +/- 20%, therefore the average value is used for the frozen ex ante claim.			

The ED approved frozen ex ante claim for this project are an annual savings impacts of 576,326 kWh and 58.8 kW.

Review Conclusion

The ED-adjusted ex ante savings calculations are conditionally approved pending post installation inspection report verifying:

- that the chiller was installed,
- that the new chiller is operating as the lead chiller (minimum 30 days verification), and
- that the chiller performance data provided matches the model of the actual chiller installed.

The conditionally approved ex ante savings values are the average between ED’s estimate and the IOU’s final estimate.

Summary of ED Requested Action by the IOU

In order to complete an ex ante review the ED recommends that PG&E submit the following documentation as they become available:

1. Measure EUL.
2. Measure NTG ratio.
3. Post installation inspection report.
4. Documentation such as manually-entered chiller logs or data from the new chiller control panel showing the new chiller to be continuously energized and operating as the lead chiller since start up for a minimum of 30 days.
5. Verification that the chiller performance data matches the model of chiller approved/installed.
6. Final cost documentation

Table 1-2: Project Overview

Description	IOU Proposed Ex Ante Data	ED Recommendations
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures)	Replace on burnout	Replace on burnout
Project Cost Basis (Full Cost, Incremental Cost)	Incremental Cost	Incremental Cost
RUL (Early retirement projects only, otherwise N/A (not applicable))	NA	NA
EUL	TBD	20 years
First Year kWh Savings	634,207	518,445
First Year Peak kW Savings	56	61.6
First Year Therms Savings	0	0
kWh Savings (RUL Period)	NA	NA
Peak kW Savings (RUL Period)	NA	NA
Therms Impact (RUL Period)	NA	NA
kWh Savings (EUL thru RUL Period)	634,207	518,445
Peak kW Savings (EUL thru RUL Period)	56	61.6
Therms Savings (EUL thru RUL Period)	0	0
Annual Non-IOU Fuel Impact (RUL Period)	NA	NA
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	NA	NA
Net-to-Gross Ratio	Not provided	Assessment not completed

Table 1-3: Detailed Review Findings

Reviewed Parameter	Analysis
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Replace on burnout
	ED Assessment: Correct
	ED Recommendation: None
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Incremental cost as determined from DEER 2005
	ED Assessment: Correct cost basis, method acceptable
	ED recommendation: None
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: N/A.
	ED Assessment: N/A
	ED recommendation: N/A
EUL	IOU Proposal: Not provided
	ED Assessment: 20 years based on DEER 2008
	ED Recommendation: 20 years
Savings Assumptions	IOU Proposal: Annual load profile generated from 11 months of chiller log data provided by the customer. Chiller performance data obtained from the manufacturer, baseline chiller performance curves from Statewide Customized Offering Procedures manual. New chiller expected to operate as the lead chiller, energized continuously.
	ED Assessment: Reasonable approach; allow 7 days for annual chiller maintenance.
	ED Recommendation: ED performed an independent calculation to estimate the savings impact for this project.
Calculation Methods/Tool review	IOU Proposal: Spread sheet model and analysis
	ED Assessment: Reasonable approach.
	ED Recommendation: Approved.
Pre- or Post-Installation M&V Plan	IOU Proposal: Post installation verification required.
	ED Assessment: Reasonable approach.

Reviewed Parameter	Analysis
	ED Recommendation: Verify: chiller installation, new chiller operating as the lead chiller for 30 days, and that chiller performance data used in the analysis matches the model of chiller installed.
Net-to-Gross Review	IOU Proposal: Not addressed
	ED Assessment: Not assessed
	ED Recommendation: None